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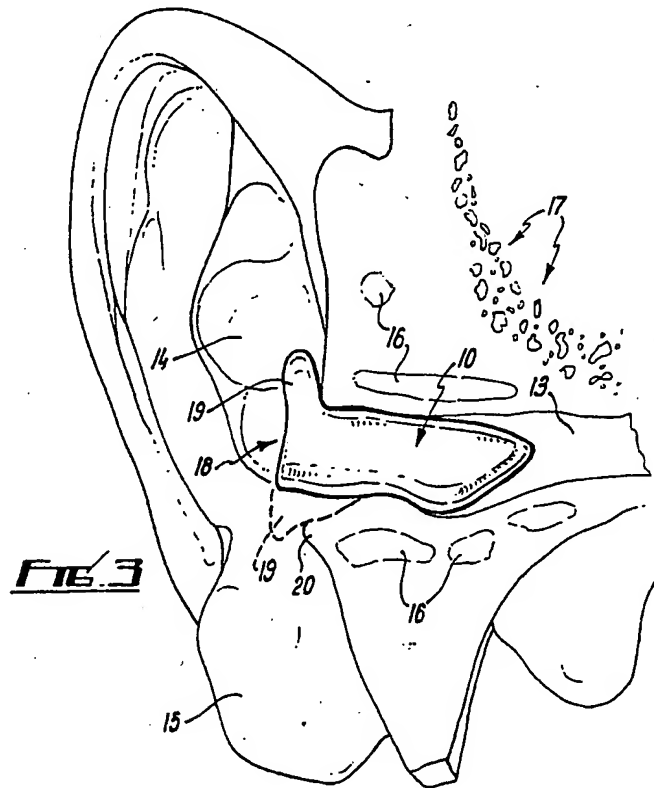
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(54) Deformable ear plug

(57) The plug 10 is of material, such as silicone, which sustains its shape but can be manually changed from one shape to another and is initially tapered so that when pushed into an outer region of a user's outer auditory passage 13 changes in shape so as to conform in shape to a length of the passage. An outer portion 19 of the plug may overlap a marginal portion 20 at the mouth of the passage 13. The plug may be withdrawn and used to make a plug of less deformable material.



FILE 2



SPECIFICATION

Improvements in or relating to ear plugs

This invention relates to ear plugs.

- 5 Ear plugs are known which essentially have a fixed shape.

According to one aspect of the invention an ear plug is of material which sustains its shape but can be manually changed from one shape to another.

- 10 According to another aspect of the invention an ear plug is shaped to conform to a length of the outer auditory passage of a user.

- According to another aspect of the invention an ear plug comprises material which sustains its shape and can be manually manipulated so that on being pushed into an outer region of a user's outer auditory passage changes in shape so that part of the plug conforms to the shape of a part of the passage.

- 20 The ear plug may be of flexible material and have one end of lesser cross-section than the other so that the one end can be inserted into a user's outer auditory passage and the other end pressed to make part of the plug conform in shape to a part of the passage.

- 25 The ear plug may comprise material which sustains its shape and can be manually changed from one shape to another and has a narrower and a wider portion so that the narrower portion can be inserted into an outer region of a user's outer auditory passage, pressure on the wider portion causing the plug to change shape so that part of the plug conforms to the shape of part of the passage.

The part may comprise a length of the passage.

- 35 The invention includes a person having in an ear an ear plug as defined.

- Also according to the invention a person has in an ear an ear plug which is of flexible material and part of which conforms to the shape of part of the outer auditory passage.

- 40 Also according to the invention a method of inserting an ear plug comprises inserting the end of the plug into an outer region of a user's outer auditory passage and pressing on the other end of the plug to change the shape of the plug so that part of the plug conforms to a part of the passage.

- 45 A suitable material for the plug is silicone but other manipulable flexible materials which are medically inert can be used.

- 50 Further according to the invention a method of making an ear plug comprises inserting into an outer region of a person's outer auditory passage material which on such insertion conforms in shape to part of the region, removing the shaped plug, using the shaped plug to form another plug of corresponding shape so that the other plug when inserted also conforms to said passage region shape, said other plug having a degree of resilience but not being permanently deformable by manual pressure.

- 60 The invention may be performed in various ways and one specific embodiment with possible modifications will now be described by way of example with reference to the accompanying drawings, in which:

Fig. 1 is a perspective view of an ear plug according to the invention;

Fig. 2 is a perspective view of another plug; and

- 70 Fig. 3 is a perspective view showing the plug in an ear.

- An ear plug 10 is made from flexible material which can be readily moulded into different shapes and is self-sustaining in the different shapes. One suitable soft material is silicone. The plug 10 is generally of greater cross-section at one end 11 than at the other end 12 and is of generally reducing cross-section between the ends. The plug 10 can be conical or have a slightly larger cross-section near the end 11, as shown in Fig. 2.

- 80 In use the reduced-section end is inserted first into the outer auditory passage 13 and the plug 10, on being pressed, changes in shape so as to conform at at least one location, and in general along a length thereof, to the passage 13 to effectively seal off the interior of the passage 13 from the outer ear 14. The ear lobe is shown at 15, cartilage at 16 and temporal bone at 17. On insertion, typically an outer portion 18 of the plug is pushed laterally to form an enlarged part 19 which overlies and engages the marginal portion 20 at the entrance to the passage 13. As shown dotted the plug may overlap around the whole marginal portion 20.

- The plug 10 is easy to insert into the entrance of the passage 13 and readily takes up the contour of the passage 13 in a user. The passages 13 in different people have different shapes. The plug when inserted retains its shape, is inert, medically safe and may be coated with medicated talcum powder to assist handling. The plug can readily be manually removed from the ear canal or passage 13, has good noise attenuation properties and will reduce the threshold of pain and discomfort from excessive noises. The plug when properly and firmly inserted can act to prevent water from entering the middle ear through the passage 13, protecting the ear from possible bacterial water borne invasion or for preventing the hygroscopic swelling effects of water combined with Cerumen. A typical application is as a swim plug. The soft silicone plug may also be wrapped with plastic film or similar material without adverse effect on the effectiveness or safety of the plug.

- The material may be supplied with a hardener and an amount of the material mixed with the hardener and then used to form an ear plug by the user. Once this is found to be satisfactory the plug in its shaped form can be removed from the ear and a replica can be produced, by moulding or other means, of a softer and more resilient material for repeated use, for example silicone with a catalyst which when cured has an appropriate shore hardness, which essentially retains its moulded shape but is not permanently deformable by manual pressure.

125 CLAIMS

1. An ear plug of material which sustains its shape but can be manually changed from one shape to another.
2. An ear plug shaped to conform to a length of the outer auditory passage of a user.

3. An ear plug comprising material which sustains its shape and can be manually manipulated so that on being pushed into an outer region of a user's outer auditory passage changes in shape so that part of the plug conforms to the shape of a part of the passage.
4. An ear plug as claimed in any preceding claim, which is of flexible material and has one end of lesser cross-section than the other so that the one end can be inserted into a user's outer auditory passage and the other end pressed to make part of the plug conform in shape to a part of the passage.
5. An ear plug as claimed in any of claims 1 to 3, which comprises material which sustains its shape and can be manually changed from one shape to another and has a narrower and a wider portion so that the narrower portion can be inserted into an outer region of a user's outer auditory passage, pressure on the wider portion causing the plug to change shape so that part of the plug conforms to the shape of part of the passage.
6. An ear plug as claimed in any of claims 3 to 5, in which the part is a length of the passage.
7. An ear plug substantially as hereinbefore described with reference to and as shown in Fig. 1, or Fig. 2, of the accompanying drawings.
8. A method of inserting an ear plug comprising inserting the end of the plug into an outer region of a user's outer auditory passage and pressing on the other end of the plug to change the shape of the plug so that part of the plug conforms to a part of the passage.
9. A method of making an ear plug comprising inserting into an outer region of a person's outer auditory passage material which on such insertion conforms in shape to part of the region, removing the shaped plug, using the shaped plug to form another plug of corresponding shape so that the other plug when inserted also conforms to said passage region shape, said other plug having a degree of resilience but not being permanently deformable by manual pressure.
10. An ear plug when made by a method as claimed in claim 9.
11. A person having in an ear an ear plug which is of flexible material and part of which conforms to the shape of part of the outer auditory passage.
12. A person having in an ear an ear plug as claimed in any of claims 1 to 7 or claim 10.